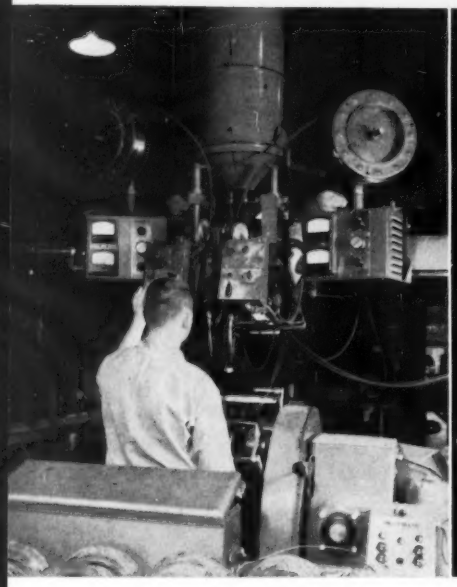
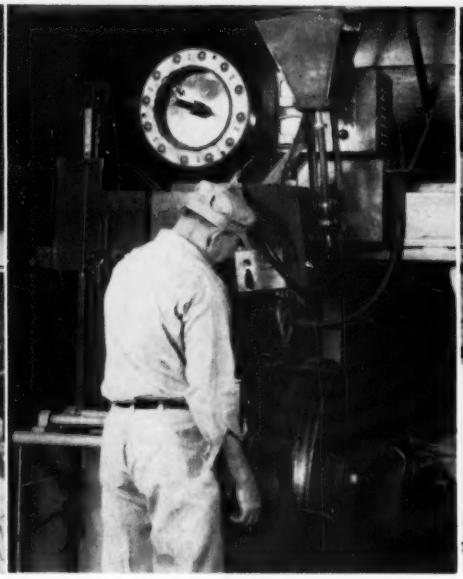
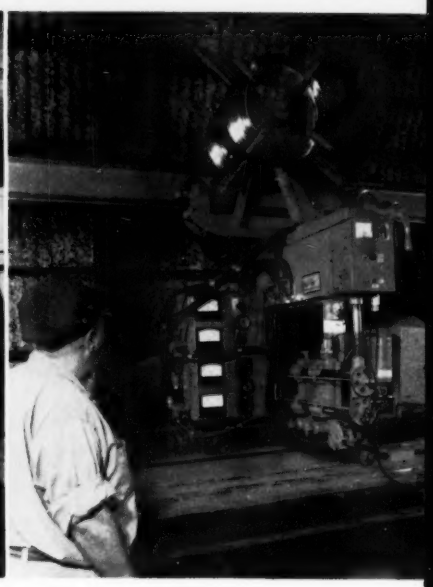
COAL MINING

April, 1959 Volume 36, No. 4

BECKWITH TRACTOR UNDERCARRIAGE REBUILDING WILL SAVE YOU MONEY!







ROLLERS IDLERS TRACKS

Add thousands of hours of life to your Caterpillar* track-type tractor running gear . . . track rails, rollers, idlers and sprockets . . . through Beckwith Machinery Company's rebuilding service. New rebuilding equipment of the latest submerged arc-welding type such as the Multimatic and L & B machines shown above in our shops can effect substantial savings for you on maintenance and new parts.

Under our "Fair Price" Roller Exchange Plan you pay only for the cost of bringing your trade-in roller up to factory new-parts standards, based on the class of wear of your old roller. You pay a fair price instead of a flat price. The "Idler Rebuild Offer" gives you free information to determine whether idlers are worn within limits so that they can be welded to effect savings. In Beckwith's "Rail Reviver Plan" we build up your track links to original specifications by submerged arc welding of both rails at once.

Check with any Beckwith field representative or see any of our Parts or Service Managers for complete details on this cost-saving service.

HERE'S WHAT TYPICAL OWNERS REPORT:

"I'm having Beckwith rebuild my Cat D9 rollers for the second time because the first welding job put them in such good condition that they gave me comparable service to the production line originals."

Wilmer Kimmel, Kimmel Coal Company of Arona, Pa.

"We are entirely satisfied with the appearance and performance of the undercarriage rebuilt for our D9 tractor by Beckwith. We are especially pleased with the substantial savings."

William Edmunds, Edmunds Contracting Company of Frenchville, Pa.

"Frankly, we have been hesitant to rebuild rollers, rails or idlers but after watching the performance of Beckwith-rebuilt items in the field we feel the quality of workmanship makes it worthwhile to have our Cat D9 undercarriage rebuilt by your specialists."

Ray Turner, E. N. Turner & Sons of Harrisville, Pa.

Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

BECKWITH MACHINERY CO.

BRADFORD, PA. • 361-369 Congress St. • Phone 3166
CLEARFIELD, PA. • Old Town Rd. • Phone 5-9635
ERIE, PA. • 1356 E. 12th St. • Phone 4-2494
SOMERSET, PA. • Rt. 219 N. • Phone Somerset 6533
CLARKSBURG, W. VA. • U.S. Rt. 20 • Phone Main 4-5476

6550 Hamilton Avenue • PITTSBURGH • Phone: MOrrison 1-6900

Published monthly by Modern Mining Publishing Company. Publication Office—Advance Printing & Litho Co., Erie, Pa. Editorial and Executive Offices—Erie, Pa. Pittsburgh Offices—P. F. JASIK, Publisher, 4575 Country Club Drive, Pittsburgh 36, Pa. Price: In the United States, $3.00 year; all other countries $5.00. Single copy 25 cents. Entered as second class matter at the Post Office at Erie, Penna., under the act of March 3, 1879.

engine power

NEW D342

CONTINUOUS HORSEPOWER WITH RADIATOR COOLING FAN*

10:1 COMPRESSION RATIO

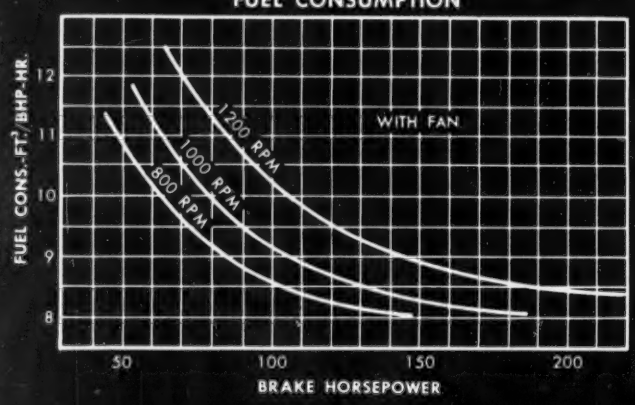
R.P.M.	800	900	1000	1100	1200	1300
H.P.	146	166	185	202	214	225

7:1 COMPRESSION RATIO

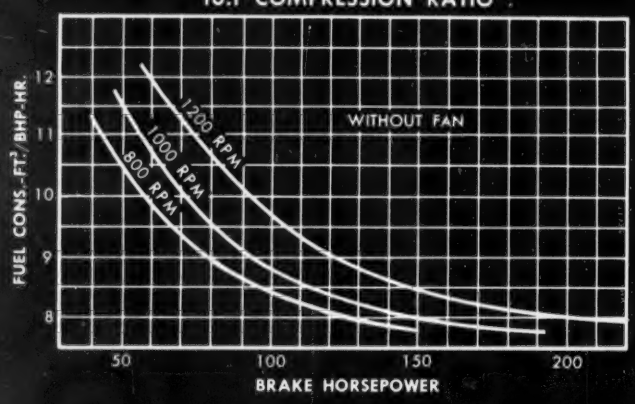
R.P.M.	800	900	1000	1100	1200	1300
H.P.	127	145	162	177	189	197

*Additional Power Available With Heat Exchanger Cooling

FUEL CONSUMPTION



10:1 COMPRESSION RATIO



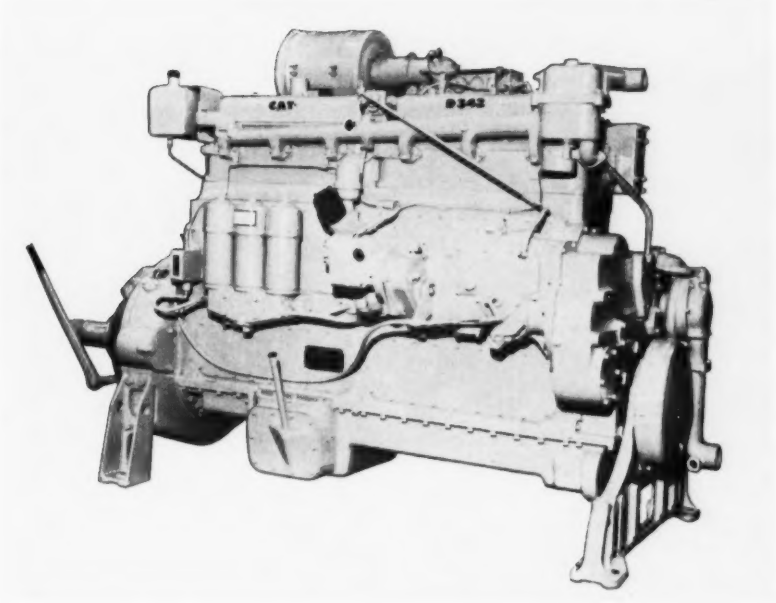
With two compression ratios available, the Caterpillar D342 Spark Ignition Engine gives you the opportunity of getting the utmost in performance. The 10:1 ratio is for use with dry natural gas (as supplied through pipelines) which has a very high percentage of methane. For "wet" natural gas, butane or propane, the 7.5:1 compression ratio is used. Shown in the charts, at left, are the wide-open throttle continuous horsepower ratings available with Caterpillar Spark-Ignition Engines. The basic engine, which is designed for diesel operation, has a compression ratio of 15.7:1. Continuous Horsepower at 1200 RPM—7.5:1 compression ratio 200 HP; 10:1 Compression ratio 225 HP.

Fuel consumption curves on partial loadings clearly show the outstanding efficiency of this D342 engine to reduce your power expenses. Based upon present gaseous fuel costs, this Spark-Ignited Engine can reduce your fuel bill up to 50% over diesel operation. Fuel Consumption 10:1 compression ratio at 225 HP at 1200 RPM—7.9 cu. ft./BHP-hr. of 1000 BTU/cu. ft. gas. Write for full power and fuel consumption curves.

The heavy duty piston used in the D342 is designed with an efficient combustion chamber. A cast-in cast iron ring band gives longer life to the lightweight, cool-operating aluminum piston. It is simple to change the compression ratio. Only the piston needs to be exchanged to get the 10:1 or 7.5:1 compression ratio. You can get the utmost in efficient operation for your location by selecting the proper compression ratio, as influenced by the type of fuel available.

Maximum economy is assured by use of the low tension ignition system to get a strong spark at each plug. The low tension current from the special magneto generator is converted into high tension in the individual spark coils located adjacent to each spark plug. This ignition current is of a quality not possible to obtain with the common high tension system, which is subject to high line losses.

Spark Ignition Engine
from Beckwith
Burns a wide range of low cost gaseous fuels



To meet demands for a smaller spark-ignition engine, Caterpillar and Beckwith Machinery Company offer the new Cat D342 Spark Ignition Engine which develops efficient power at surprisingly low fuel costs.

Utilizing most of the major components of the diesel engine used in the Caterpillar D8 Diesel Tractor, this engine is low in first cost...and, like other Caterpillar products, has long life built-in.

If your fuel requirements or working conditions change, the D342 Spark-Ignition Engine can easily be converted to full Diesel operation by changing pistons and changing to a diesel fuel system in place of the ignition and carburetor equipment.

There are many applications where this economical power can be used effectively. These durable Spark-Ignited Engines offer great compactness and their new features provide high output with excellent performance in a wide range of installations. The basic requirement is a source of natural, petroleum or sewage gas. Costs can be reduced in many cases by using this engine to power drill rigs, coal tipples, pumping units, rock crushers, refrigeration plants, air compressors, saw mills, air-conditioning, irrigation systems, etc. It can also be used at low cost with electric generators for electrical power on many other applications.

Our Beckwith Caterpillar Dealer Engine Specialists will gladly help analyze your needs and recommend the Diesel or Spark-Ignited Engine that will do your job best. Call us for complete details . . . no obligation, of course.

Caterpillar Spark-Ignition Engines. Continuous Power.

- **D342-225 HP at 1200 RPM**
- **D397-450 HP at 1200 RPM**
- **D375-300 HP at 1200 RPM**

(10:1 compression Ratio)

*Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

BECKWITH
MACHINERY CO.

BRADFORD, PA. • 361-369 Congress St. • Phone 3166
CLEARFIELD, PA. • Old Town Rd. • Phone P O 5-9635
ERIE, PA. • 1356 E. 12th St. • Phone 4-2494
SOMERSET, PA. • Rt. 219 N. • Phone Somerset 6533
CLARKSBURG, W.VA. • U.S. Rt. 20 • Phone Main 4-5476

6550 Hamilton Avenue • PITTSBURGH • Phone: MOntrose 1-6900

INTRODUCING...

THE NEW INTERNATIONAL TD-20
MORE POWER, MORE VERSATILITY, MORE GET UP AND GO....

C & F General Contracting Co. of Shamokin, Pa., is one of the earliest purchasers of I-H's new power-packed work-horse—the TD-20. Listen to these glowing reports.

New TD-20 working at C & F General Contracting Company, Shamokin, Pa. Coal bank screenings are reclaimed from a culm bank more than 100 years old at the rate of 1,000-1,500 tons per seven-hour day.

Says President Walter Fogler:

"The new TD-20 dozer replaced a TD-18 which worked approximately 4,000 hours during 17 months of continuous operation, moved over ½ million tons of material with less than 20 hours lost for minor repairs. The TD-20 can doze up to one-half more material per load than the old TD-18. It's faster, both in forward and reverse. Maximum dozer push—350 yards. The TD-20 has been the most effective crawler we have used on the job."

President Fogler goes on to say:

"We have been using International crawlers for the past 10 years in various coal field jobs. (6 TD-18's and a TD-20.) We know the International crawler product, the good distributor service behind it, the fast workability, and the long overall life of the machine."

Says Operator Charles Bressi:

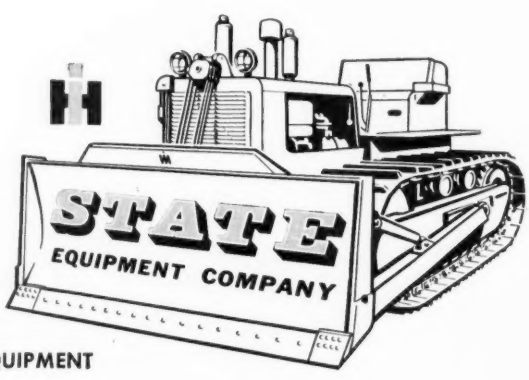
"The TD-20 really has the workability and power I need to do this job, plus unmatched operator ease. The forward-reverse "shuttle bar" has greatly increased production with much less operator fatigue."

Call the State branch nearest you for a demonstration and information about the big, new, powerful TD-20.

NEW YORK
Albany, UNion 9-5393
Syracuse, GRanite 5-5169
Potsdam, Potsdam 4158

VERMONT
Montpelier, CApitol 3-5225

PENNSYLVANIA
Franklin, IDlewood 2-2115
Harrisburg, CEdar 4-5995
Kingston, BUtler 7-1108
Philipsburg, DIckens 2-4880
Pittsburgh, FOrrest 4-0200



CALL STATE FOR SERVICE. TOP VALUES IN NEW AND USED EQUIPMENT

COAL MINING

Vol. XXXVI APRIL, 1959 No. 4

Contents

Published by

Modern Mining Publishing Company

4575 Country Club Drive

Pittsburgh, Pa. Phone TU. 1-9411

P. F. JASIK, Publisher and Editor

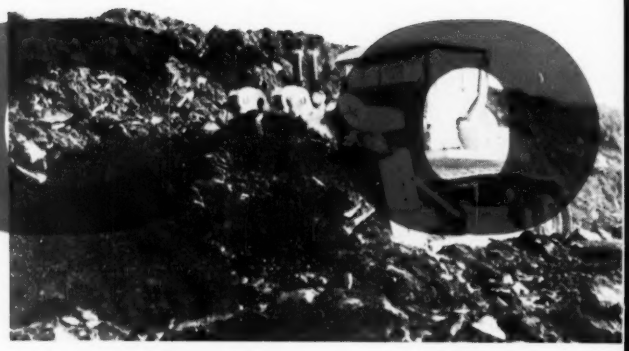
☆

Printed by

ADVANCE PRINTING & LITHO CO.

1118 Chestnut St.

Erie, Pa. Phone 2-2780



ANDE

Manitowoc and Euclid — the most rugged, heavy-duty stripping equipment you can buy — plus a complete list of smaller lines . . . compressors, buckets, air tools, etc. are yours through Anderson Equipment Company.

There's no stripping or coal loading job you can't handle with equipment from Anderson — so why not make Anderson your equipment headquarters and get the advantages of the best in stripping equipment plus complete service facilities for every machine sold.

SUPPLIERS OF THE INDUSTRY'S

EQUIPMENT COMPANY

MANITOWOC ENGINEERING CORP.
INSLEY MANUFACTURING CORP.
ELECTRIC STEEL FOUNDRY CO. (ESCO)
OWEN BUCKET COMPANY

EUCLID DIVISION — G. M. C.
GAR WOOD INDUSTRIES
McCAFFREY RUDDOCK TAGLINE CORP.
McCARTER IRON WORKS, INC.

Lima 2400 removing overburden at C & K Coal Co., Parker, Pa.

equipment from Highway

assures you lower costs... increased production...greater profits!

Allis-Chalmers • Lima Shovels, Cranes, Draglines • Master
Thor • Gar Wood • Lima Roadpackers
Jaeger • Rogers Trailers • Heltzel
Buffalo-Springfield • Tractomotive

AA-9236

Lima 2400s, like this unit used by J. Russel Cravener, Echo, speed production at leading mines.

Highway

HIGHWAY EQUIPMENT COMPANY
6465 Hamilton Ave. • Pittsburgh 6, Pa.
40 Hoover Ave. • Du Bois, Pa.

● Paul A. Doorley, executive vice president of Connellsville Manufacturing and Mine Supply Company has been elected president of the Connellsville (Pa.) Chamber of Commerce for the 1959-60 fiscal year.

PAUL A. DOORLEY

A native of Uniontown, Mr. Doorley is a graduate of Rider College of Trenton, N. J. He is a past president of the Uniontown Jaycees, in fact, the organization's first elected head. He also was the first president of the Dale Carnegie Club International in Uniontown.

● Henry Crown, chairman of Material Service Corporation, of which Freeman Coal mining Corporation is a division, announced that development will begin promptly of a new 7,000 ton per day, deep shaft, highly mechanized coal mine in acreage some 3½ miles East of Benton in Franklin County, Illinois. Initial production from the mine, which will employ some 350 men, is expected in 1960.

To be known as Orient No. 5, this new mine will be served jointly by the CB&Q, C&EI, IC and MoP railroads. Cleaning processes in the preparation plant will employ heavy media separation and air flotation equipment. The mine will operate in the famous No. 6 Franklin County seam.

● Retiremnt of A. W. Rothacker, executive vice president and director of The Valley Camp Coal Co. was announced at the annual meeting on March 10 in Cleveland. William J. Lawson, president of Great Lakes Coal and Dock Co. of Milwaukee, a wholly owned subsidiary, was elected a director to fill the vacancy and Herbert S. Richley, vice president of Valley Camp, was elevated to executive vice president. Mr. Richley and Carl W. Steiss, treasurer, were elected to the executive committee. Robert W. Homan, a certified public accountant, formerly with Lybrand, Ross Bros. & Montgomery, was elected assistant treasurer and assistant secretary.

● A new, front end telescopic hoist for 8, 9, and 10-foot bodies has been developed recently at Marion Metal Products Company. Over the past year, it has been completely job tested and approved and is now available.

The new hoist includes three models. The F-513T-65 is for 8-foot body lengths; the F-513T-72 is for 9-foot bodies; the F-513T-82 is for 10-foot bodies.

One of the most outstanding features of this competitively priced hoist is the ease in which the cylinder is attached to the body. This method of attachment not only speeds up installation but also allows fast, easy detachment for any servicing of the hoist in the field. The top connection is connected to the top of the cylinder before the body is installed. Then as the body is let down, the cylinder will guide itself into place in the cylinder housing. The body is then secured from the outside at the top by two bolts that fasten the body to the weld plate that is already attached to the hoist.

The oil reservoir with these model hoists is mounted on the side of the frame. This makes it possible to use a deep tank to provide a quieter, cooler, more efficient hydraulic system and eliminate the danger of drawing air into the system.

Other benefits and features include a weight savings of from 65 to 90 pounds; Marion's standard-duty pump with a safety relief valve; fast dumping speed. The hoists mount in their own subframes to provide a rugged, sturdy unit.

Do You Know?

● Companies are getting more choosy in hiring engineers. Gone are the days when an engineering degree meant "open sesame" to a good job for graduating seniors, reports Cornell University.

"The cry now is not so much for more engineers as for better ones," said Donald H. Moyer, director of the office of student personnel for the University's College of Engineering.

The top half of this year's class will have "little placement problem," he said, but the below-average student may have to scratch around to find a suitable job.

He traced to the recession one reason for the back-off by industry. But other things have happened also: 1. Some companies have started training liberal arts graduates for some jobs previously held by engineers. 2. Many companies have hired technicians and technical assistants for similar positions.

An accelerated business recovery could add to the demand for engineering graduates this June, he said, but there will be 10% more graduates available this year than last. So this year's employment picture is expected to be about the same as last year's.

* * *

● A prominent physicist has called for unified scientific research programs "encouraged and supported" by the Federal Government where feasible. Failure to recognize this has led to "serious loss in the American position in many sciences."

Dr. L. V. Berkner, president of Associated Universities, Inc., New York City, in a lecture sponsored by the National Science Foundation and the American Association for the Advancement of Science, said lack of such programs is slowing down solutions to many problems.

The basic deficiency in our present research organization stems from the fact that — except in fields related to military support, atomic energy, and health —there is no means whereby integrated research programs can be encouraged and supported by the Federal Government, he said.

In some fields, the character of the problems is such that they "cannot advance significantly without means for package support that permits integrated advances in the fields," Dr. Berkner said.

Not all science will yield to this type of support, but the form could be tailored to fit the needs, he suggested.

"This is clearly not recognized in the present policy of the National Science Foundation in supporting only a variety of unconnected research projects," he said.

HERE AND THERE IN THE COAL INDUSTRY

C. O. CARMAN

K. S. HOBBS

● Six personnel changes are announced by Eastern Gas and Fuel Associates, effective March 1.

K. S. Hobbs has been appointed superintendent of the company's Stotesbury Nos. 10 and 11 mines, near Beckley, W. Va. Mr. Hobbs joined the company in 1947 as an assistant supply clerk.

C. O. Carman is named production engineer for Eastern's Low Volatile Division, which includes the company's Keystone, Eccles, and Stotesbury mines, all in southern West Virginia. Mr. Carman joined the company as a section foreman in 1941.

C. J. Kirby, superintendent at the Stotesbury Nos. 10 and 11 mines, has been granted a leave of absence. A veteran in the coal fields, Mr. Kirby joined Eastern as a section foreman in 1932.

Donald W. Hunter, production engineer at Eastern's Sonman mine in Central Pennsylvania, has been named resident engineer at the Wharton No. 1 mine at Wharton, W. Va. He joined the company as a rodman in 1951.

John P. Baugues, who has been the resident engineer at the Wharton No. 1 mine, is transferred to resident engineer at the company's Federal No. 1 mine, near Fairmont, W. Va. He joined Eastern as a rodman in 1950.

Frank W. Riddle, who has been resident engineer at the Federal No. 1 Mine, has been named a member of the Chief Engineer's Staff in the Engineering Department of Eastern in Pittsburgh. He joined the company as a transitman in 1945.

● Dennis A. Mooney has been appointed superintendent of the Montcoal operations of Armco Steel Corporation's West Virginia coal mines.

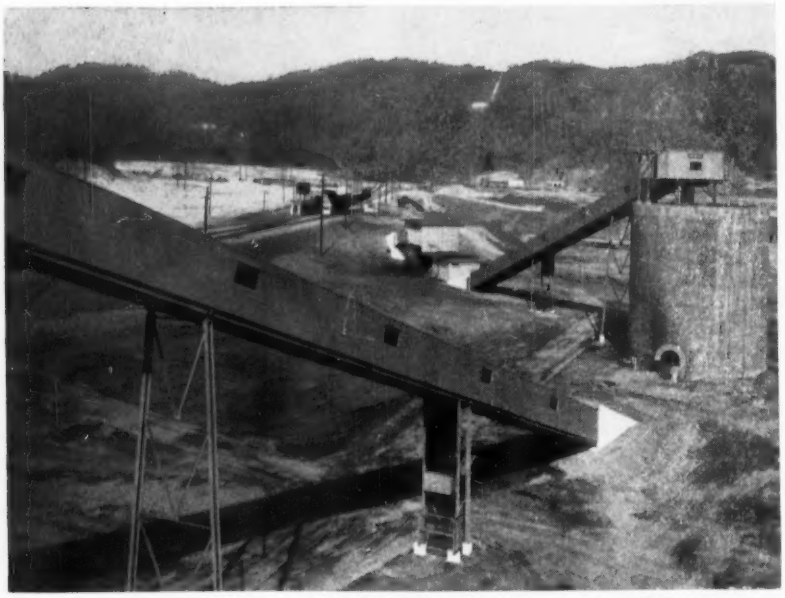
The announcement was made by C. O. Kane, manager of the company's coal mining operations here.

Mooney succeeds A. E. Oakley, who is retiring after 25 years with Armco.

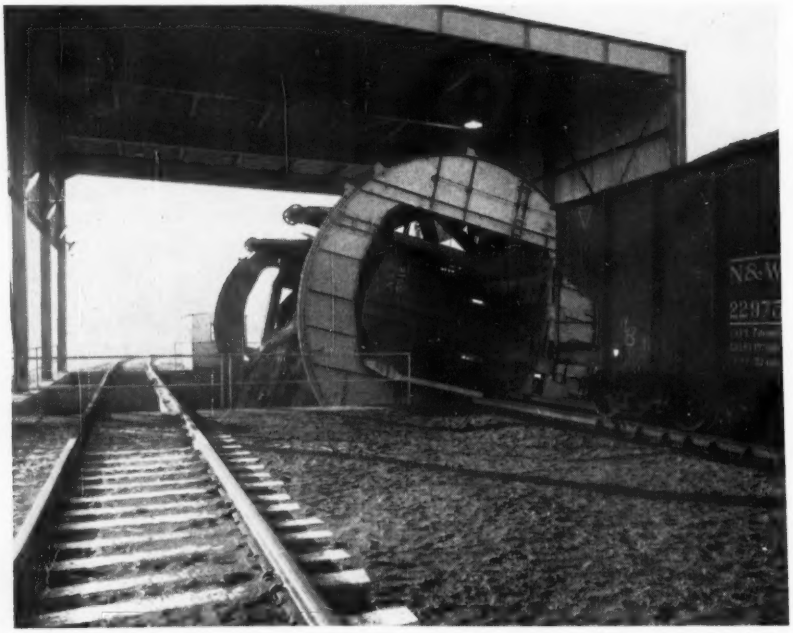
Mooney joined Armco at the company's Nellis, W. Va., mine in 1929. After a variety of assignments, he was made assistant foreman in 1940. In 1945, Mooney was named general foreman of the Nellis mine.

He became general foreman of the Montcoal mine in 1948, and held that position until his recent promotion.

Moss No. 3 Preparation Plant Of The Pittston Company



Raw coal from the mine is dumped from railroad cars by Link-Belt rotary car dumper at center rear. From dumper hopper the coal is conveyed at 2,000 t.p.h. to crusher station and then to 2,500-ton storage bin. Plant feed belt conveyor (gallery in foreground) carries coal to top of preparation plant.



Twenty-Two 70-ton cars are dumped in 45 minutes of each hour by Link-Belt rotary railroad car dumper, which operates on 60-second dump cycle.

● One of the richest virgin seams of high quality metallurgical coal in the United States is now being mined at the Pittston Company Moss No. 3 mine. By the end of 1959 it will be producing at the rate of 5 million tons a year.

The rich Tiller seam in southwest Virginia averages 10 to 15 ft. in thickness. But because it is separated into two benches by a rock parting, for years mining engineers considered it neither physically nor economically feasible to mine. Profitable recovery of this coal has been made possible only by:

1) full-seam mining with continuous mining machines which load not only the coal but the rock, shale and other impurities; and

2) the largest and most highly automated coal preparation plant of its kind in the world — an automatic processing machine ten stories high which cleans 800 lbs. of coal *each second*, separating the coal from impurities and producing both metallurgical and steam coal products.

The Moss No. 3 coal preparation plant of Clinchfield Coal Company Division of The Pittston Company, with capacity of 1,500 tons an hour, was designed, built and erected on a "turnkey" contract by Link-Belt Company.

The plant is located at Clinchfield Va., only a short distance from the 450-t.p.h. Moss No. 2 plant, which was also built by Link-Belt on a turnkey contract.

The coarse coal is cleaned in Link-Belt's new tank-type heavy media vessels and the fine coal on concentrating tables in four parallel coarse coal and fine coal circuits. After cleaning, the coal undergoes additional processing, including crushing, sizing, mechanical dewater-

ing and heat drying before being loaded into railroad cars.

One man in the main control room has at his finger tips some 90 per cent of the plant's operations. Operators at four other control stations handle the dumping of raw coal from railroad cars, heat drying of fine coal, loading of clean coal into railroad cars and dumping of refuse in a deep valley almost half a mile away. The plant is so automatic that it requires only 16 men per shift, including greasers, oilers and mechanics.

Profitable use will be made of what is normally considered a waste material. A portion of the shale refuse will provide raw material for lightweight aggregate which will soon be produced in a plant Link-Belt is now building adjacent to the preparation plant.

Water, so important in the coal cleaning process, is circulated at the rate of 46,850 gallons a minute. A Link-Belt water clarification system recovers extreme coal fines from the water, which is filtered and treated and used over and over in a closed water system, thus conserving the plant's water supply and avoiding pollution of streams.

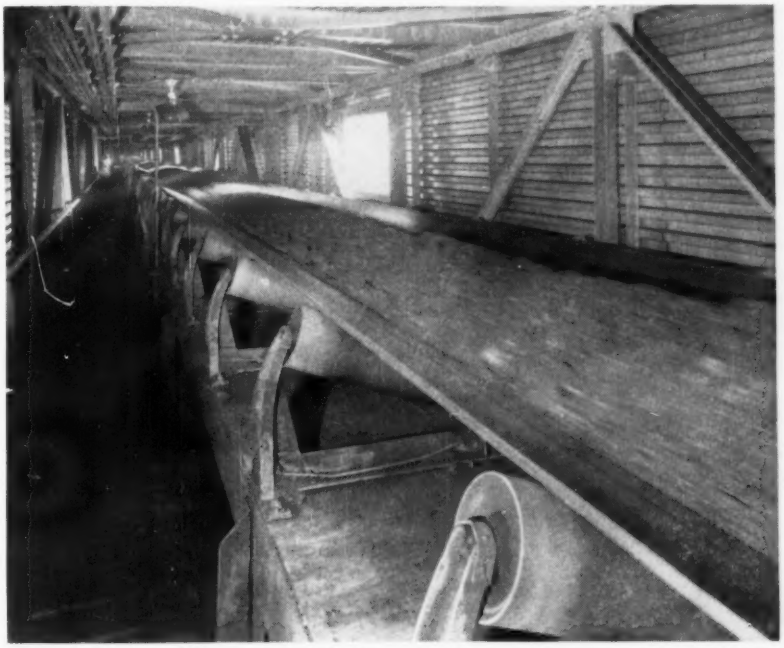
The modern machines and methods employed at the Moss No. 3 mine and preparation plant are expected to result in production of 45 tons of coal per man per day, compared with an average of 11 tons per man per day for the coal industry in the United States and one and one-half tons per man per day in Europe, according to J. P. Routh, chairman of the board of The Pittston Company.

$150 Million Development

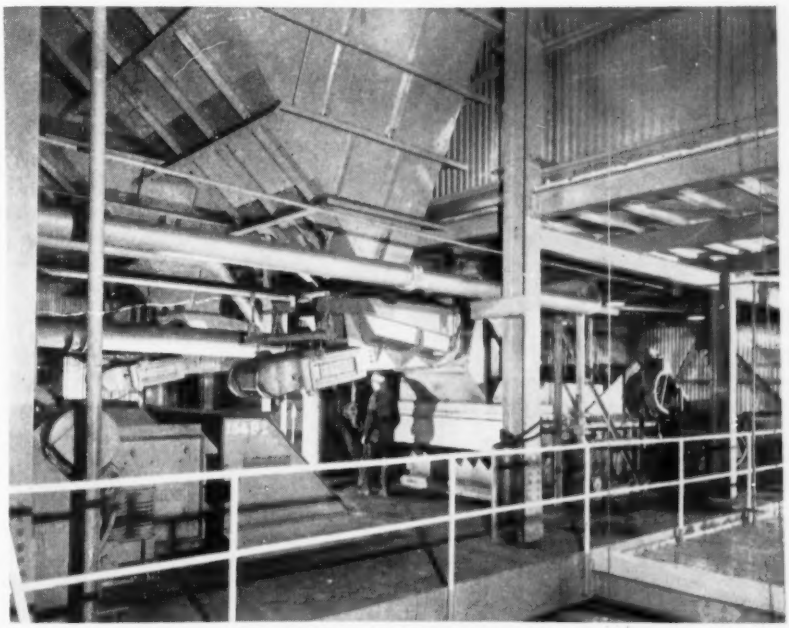
The Moss No. 3 mine is located in one of the largest and most valuable fields of virgin, unexploited metallurgical coal remaining in the United States. The Clinchfield properties in Virginia include approximately 300,000 acres, with coal reserves estimated at more than one billion tons.

Over 100 million tons of recoverable coal have been allocated to the Moss No. 3 mine, assuring a minimum life of 20 years. An additional 100 million tons of the same seam, lying between Moss No. 2 and Moss No. 3, have been held in reserve for division between these two operations.

This Clinchfield expansion is part of a $150 million three-company industrial development program in southwest Virginia. Appalachian Power Company, a subsidiary of American Electric Power Company, has built a steam



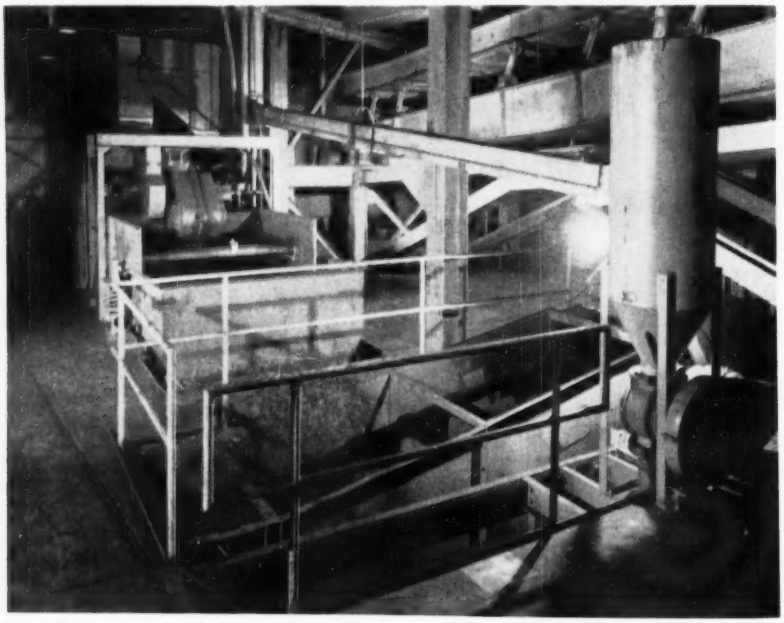
Crushed raw coal flows constantly, hour after hour, at the rate of 1,500 t.p.h. over the 60-in. wide plant feed belt conveyor, which delivers coal from storage bin to a 200-ton surge bin at the top of the preparation plant or to a transfer belt conveyor leading to a 600-ton surge bin.



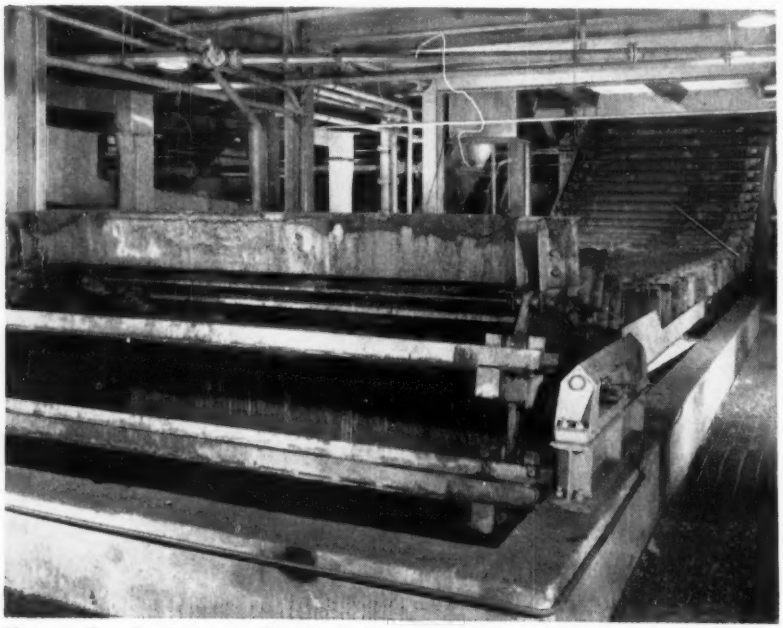
Start of the cleaning process begins when eight Syntron feeders beneath the surge bins deliver the raw coal to eight horizontal double-deck vibrating screens. These screens remove the fine ¼-in. by 0-in. coal by wet screening and pre-wet the 4-in. by ¼-in. coal.

generating plant at Carbo, Va. about three miles south of the Moss No. 3 plant. It will provide 450,000 kilowatts of additional power for the area and will consume some 1,200,000 tons of Clinchfield coal each year.

The Norfolk and Western Railway has laid 16½ miles of branch line to serve these operations. The seven-mile line from the Moss No. 3 mine to the preparation plant passes through a tunnel 8,240 ft. long, cut through a mountain to avoid laying 30 miles of track around it.



The sink product of the primary tank-type heavy media vessel in background discharges into the horizontal vibrating screen at left for draining, rinsing and dewatering and then enters the secondary heavy media vessel in foreground. The float product of the secondary vessel is steam coal, while the sink product is refuse. Oscillating conveyor delivering feed to primary vessel is shown at upper right.



Clean coal and refuse are flumed to four clean drag tanks and one refuse drag tank. The ¼-in. by 100-mesh coal (and ¼-in. by 48-mesh refuse) settle in their respective tanks. The clean coal goes to centrifugal dryers, while the refuse goes to the refuse dewatering screens. Minus 100-mesh coal and minus 48-mesh refuse overflow the tank to clean coal and refuse thickeners.

A Few Figures

The main building of the Moss No. 3 preparation plant is almost the size of a football field, 287 ft. long and 156 ft. wide. The roof of the tallest structure is 113 ft. above ground level, or about ten stories high. About 900 ft. to the north is the rotary railroad car dumper, with delivery tracks for 202 railroad cars. Belt conveyors connect the dumper house with a crusher house and storage bin, and a long conveyor gallery runs from the base of the bin to the top of the plant.

To the west is the loading area, with eight railroad tracks, five for loading. The loading tracks have space for 222 cars.

Major equipment, in addition to nine tank-type heavy media vessels, includes 36 vibrating screens, three crushers, 64 Deister concentrating tables, five drag tanks, 12 centrifugal dryers, eight Multi-Louvre heat dryers, three thickeners and five vacuum filters.

There are 14 vibratory feeders, 20 screw feeders, a reciprocating feeder, four oscillating conveyors, 30 flight conveyors, 32 screw conveyors and 22 belt conveyors. Total length of the belt conveyors is about 8,000 ft., with widths ranging from 24 in. to 72 in.

The plant has a total connected motor load of 13,650 h. p. It uses 562 electric motors, from fractional to 400 h.p., of which 23 are 200 h.p. or more. About 240 miles of wire and more than 12 miles of conduit were used. The plant has 600 push buttons.

Operation of Plant

Let's follow a typical ton of coal as it comes from the mine.

The ton of coal is one of 70 in a gondola car, which is dumped by a Link-Belt rotary car dumper. Operating on a 60-second dump cycle, the dumper unloads 22 cars in 45 minutes of each hour, with

the remaining 15 minutes devoted to switching trains into position.

From a 200-ton hopper beneath the dumper, the run-of-mine coal is carried to the crusher station by a 72-in. wide belt conveyor at the rate of 2,000 t.p.h. Here it is reduced to 4-in. by 0-in. size, and tramp iron is removed by a belt magnet. The crushed coal is delivered by belt conveyor to a 2,500-ton storage bin.

The coal is carried to the top of the preparation plant at the rate of 1,500 t.p.h. by a 60-in. wide inclined belt conveyor, being weighed electronically en route. It is deposited in a 200-ton surge bin or transferred by another belt to a 600-ton surge bin.

Coal is reclaimed from the surge bins by four pairs of Syntron vibratory feeders to four pairs of doubledeck horizontal vibrating screens. These screens scalp out slabby rock, remove the ¼-in. by 0-in. coal by wet screening, and pre-wet the 4-in. by ¼-in. coal.

After this initial separation, coarse and fine portions of coal proceed through the respective coarse and fine coal circuits.

Coarse Coal Circuits

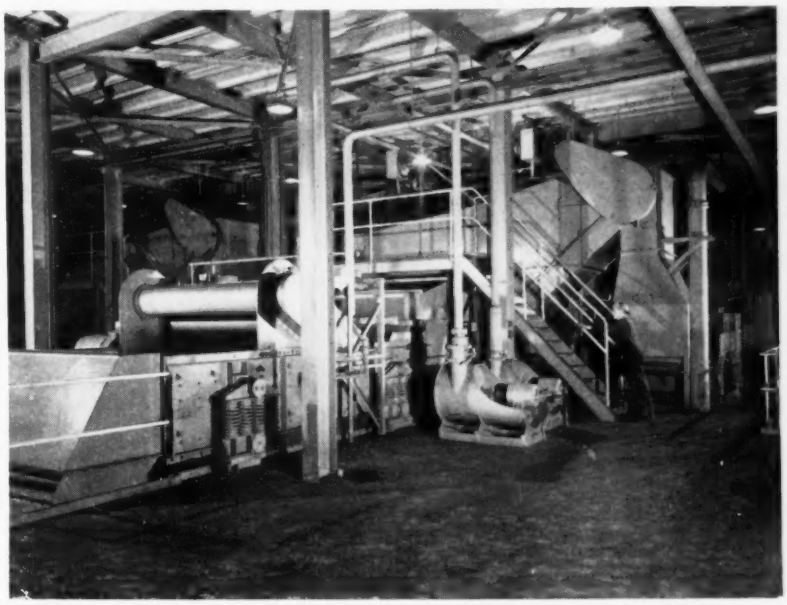
The 4-in. by ¼-in. coal from each pair of vibrating screens is collected on a 48-in. wide oscillating conveyor for delivery to one of four tank-type primary heavy media vessels, which use the basic principle of float-sink separation in a magnetite and water mixture.

The coal floats across the bath and discharges with its carrying medium over a weir onto screens for draining the free medium back into the system and rinsing the magnetite particles from the coal. The heavy material sinks to the bottom and is removed by a double-strand flight conveyor. The sink material is drained in the same manner as the float material.

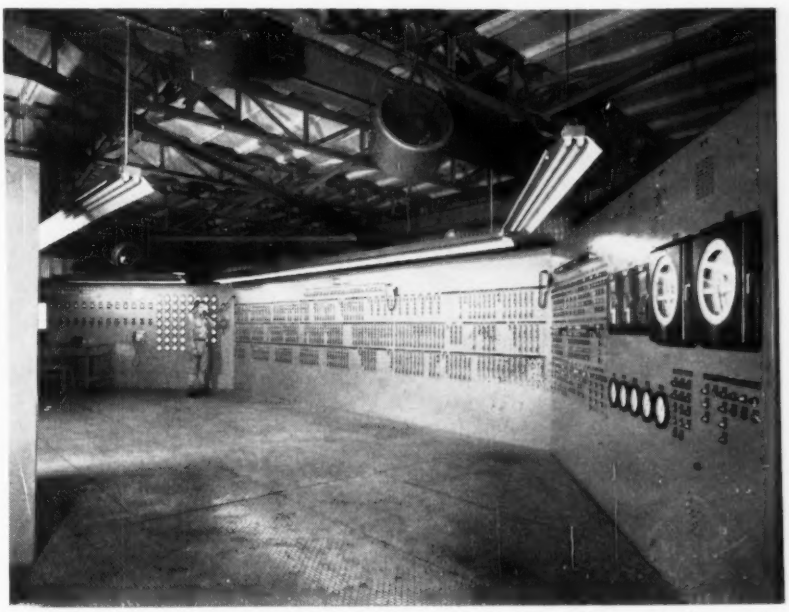
Each primary vessel has an approximate specific gravity of 1.35, producing a float product of clean high quality metallurgical coal and a sink product of refuse and steam coal.

The sink product is drained, rinsed and dewatered on vibrating screens and then fed to four secondary tank-type heavy media vessels with approximate specific gravity of 1.50. The float product of the secondary vessels is steam coal; the sink product is refuse.

A ninth tank-type heavy media vessel will be employed for further separation of the shale refuse to be used in production of light-



The clean metallurgical coal float product of each primary heavy media vessel is drained, rinsed, dewatered and sized by horizontal vibrating screen (foreground). The sink product, consisting of steam coal and refuse, is conveyed from the tank and discharged onto horizontal double-deck vibrating screen at right, and then to the secondary heavy media vessel.



Ninety per cent of machinery in preparation plant is controlled by a single operator in the main control room. This 80-ft long panel contains all push buttons, selector switches, indicating lights, ammeters, audible signal devices and other instruments for the "wet" portion of the plant. The operator starts up and shuts down the four parallel coarse and fine coal processing circuits, each consisting of primary and secondary heavy media vessels, vibrating screens, crushers, Deister tables, drag tanks, thickeners, filters, pumps and conveyors.

weight aggregate.

The balance of the refuse is collected and delivered to the slope belt conveyor for disposal.

The various fractions of clean coal are screened and crushed as necessary to provide the end products desired. Any fine coal in this system is delivered to the heat drying section of the plant.

Fine Coal Systems

Fine coal that passes through the raw coal screens beneath the surge bins and enters the fine coal circuits is pumped from raw coal sumps to eight low pressure cyclones which remove part of the water from the coal. The fine coal is cleaned on 32 double-deck Diester concentrating tables, eight for each circuit.

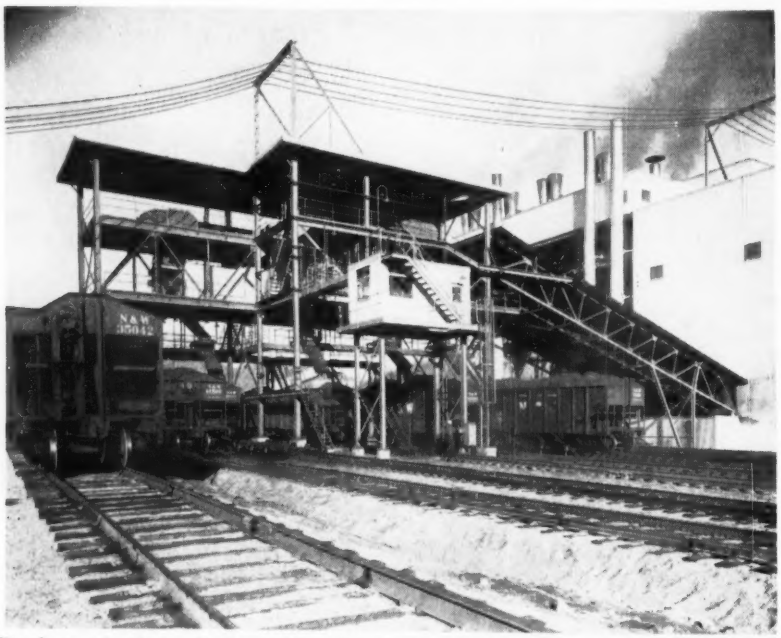
The clean coal from the tables in each circuit enters a drag tank. The ¼-in. by 100-mesh coal settles in the drag tanks and is conveyed to 12 centrifugal dryers which serve all four fine coal circuits. The centrifugally dried coal is then conveyed to the heat drying section of the plant.

Minus 100-mesh material overflows from the drag tanks to one of two 130-ft. diameter clean coal thickeners which recover the fine coal solids and clarify the wash water for re-use. In the thickener the suspended coal settles out and is raked off the concical bottom, while the clarified water overflows and is returned to the plant for re-use. Each thickener has a capacity of 1,900,000 gallons.

The fine coal solids are pumped to three vacuum filters for dewatering. The filter cake is blended in a paddle mixer with crushed steam coal and delivered to the heat drying section.

Refuse from the tables travels through a single drag tank. The ¼-in. by 48-mesh refuse settles in the tank and is discharged to a dewatering screen and then to a refuse flight conveyor. Minus 48-mesh refuse is flumed to a 130-ft. diameter thickener which is identical to the clean coal thickeners.

Refuse reclaimed from the thickeners goes to two vacuum filters, and the filter cake is conveyed to refuse disposal system.



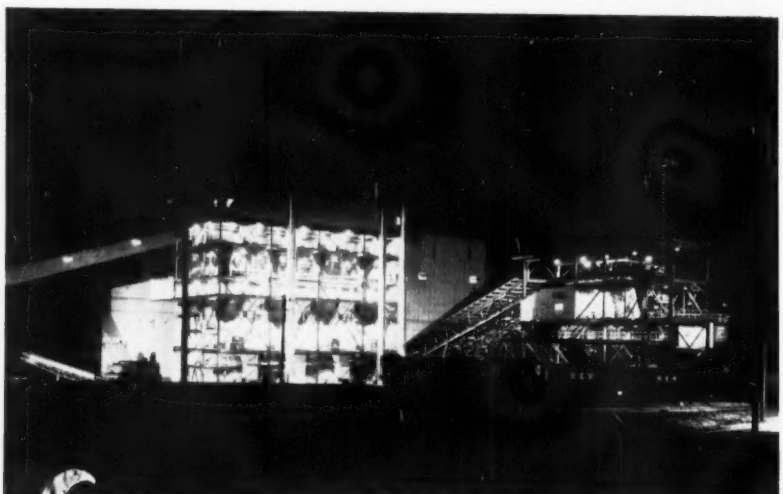
Final step in the coal preparation plant is the loading of various grades of clean coal into railroad cars. Four loading belt conveyors carrying dried steam coal, sized coal, dewatered stoker coal and dried metallurgical coal load to five railroad tracks.

Heat Drying of Fine Coal

Eight Link-Belt Multi-Louvre dryers meet the exacting heat drying requirements for fine coal. Five of these dryers are normally used to dry fine metallurgical coal consisting of ¾-in. by ¼-in. coal from the heavy media process, together with the centrifugally dried coal from the fine coal system. Surface moisture is reduced to 2 to 3 per cent.

The other three dryers are normally used for the steam coal, reducing surface moisture to about 5 per cent. The dryers are fed from their surge bins by screw feeders with remotely controlled P.I.V. variable speed drives.

Exhaust gases from each dryer receive primary cleaning in dry dust collectors and final cleaning



The Moss No. 3 plant has eight Link-Belt Multi-Louvre dryers for heat drying of fine coal. The dryer portion of the plant is not enclosed, except for the control room and wet scrubbers.

NEW CAT D7 SERIES D TRACTOR

CATERPILLAR'S *PROJECT PAYDIRT*

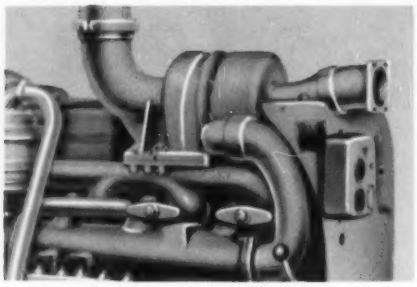
boosts your production with TWO NEW MACHINES

Project Paydirt, a multimillion dollar research and development program on Cat-built products pays off for you in the most productive earthmoving equipment ever developed.

NEW CAT No. 933 SERIES F TRAXCAVATOR

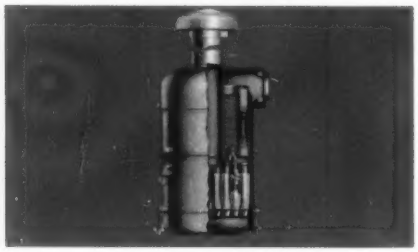
presented by your CATERPILLAR Dealer

NEW CAT D7 SERIES D TRACTOR



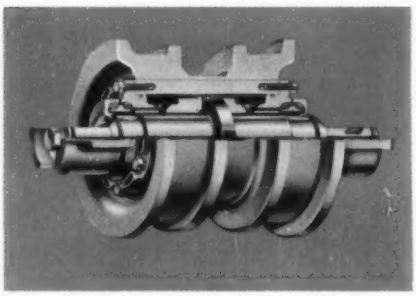
NEW TURBOCHARGED ENGINE

Develops 140 flywheel HP, 112 drawbar. Turbocharger adds more horsepower with more efficient use of fuel. Improved torque characteristics increase tractor's lugging ability 80% over previous model. In-seat starting is available.



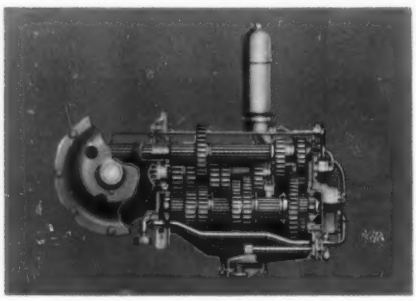
NEW DRY-TYPE AIR CLEANER

Cyclone tubes and re-usable cellulose filter element remove *at least* 99.8% of all dirt from intake air during *every* hour of operation, regardless of conditions. Cleaner can be serviced in 5 minutes. Prolongs engine life.



NEW LIFETIME LUBRICATED ROLLERS AND IDLERS

Exclusive floating-ring seals protect track rollers, carrier rollers, idlers—keep oil in, dirt out. *No lubrication* needed until rebuilding.



NEW TRANSMISSION AND FINAL DRIVE

Transmission bearings are pressure lubricated, oil is sprayed directly on gears and is full-flow filtered. Coarser pitch increases strength of final drive gear 49%, idler pinion 16%.

Look what's happened to the D7: it has more power—more features—more productive ability and operating economy than ever before! These advances make the new D7 an even better investment—'way out in front of all others in its class.

The key new features to the improved performance of the D7 are: a new Cat Turbocharged Diesel Engine that produces 140 flywheel HP and 112 at the drawbar, new dry-type air cleaner, new lifetime lubricated rollers, new lubrication system for transmission, new stronger final drive gears, and optional in-seat starting.

The new D7 with its new engine and other developments are illustrated here—and there are many more. Look them over—then tell us when we can demonstrate the new D7 on your job.

SPECIFICATIONS

Horsepower, Engine	**140**
Drawbar	**112**
Engine	**Cat Turbocharged Diesel**
Clutch	**Oil-type**
Area of ground contact, standard 20" shoes	**3775 sq. in.**
Operating weight (approx.)	**27,230 lb.**

ATTACHMENTS: Straight, Angling or No. 7G Bulldozers, Lowbowl Scrapers, Hydraulic or Cable Controls.

TO INCREASE YOUR PROFITS LOOK

NEW No. 933 SERIES F TRAXCAVATOR

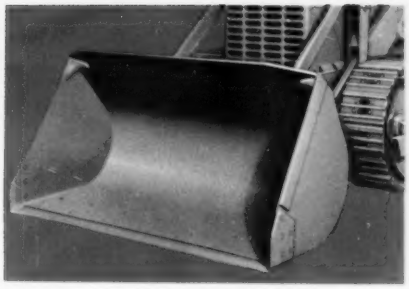
New power . . . new capacity . . . new features . . . new ruggedness make the new No. 933 Series F Traxcavator a bigger producer—up to 22% better than ever before! Now it will work more cycles per hour—handle more yards per day—give you more ease of operation—and deliver you more profit than any other excavator-loader in its class! The Series F has many new features; here are just a few: new, larger bucket, new engine, many new operator comfort features and new power train. See the new No. 933 at our headquarters; see it in action on your job and in your materials; try out the controls yourself. Make every comparison. Match the No. 933 against anything in its size. You'll be convinced: here's the most excavator-loader for your money!

SPECIFICATIONS

Standard bucket	1⅛ cu. yd.
Dumping reach (45° discharge angle)	31½"
Dumping height (center of hinge pin to ground)	9' 11¹⁄₁₆"
Tilt back at ground level	40°
Operating weight (approx.)	16,350 lb.

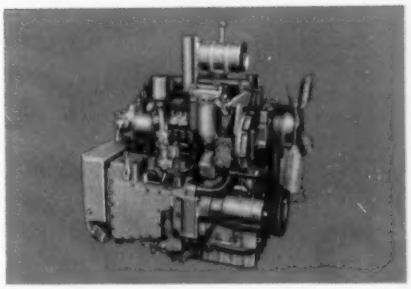
ATTACHMENTS: Straight or Angling Bulldozers, Specialized Buckets as the exclusive Side Dump, Log and Lumber Fork.

TO **CATERPILLAR**



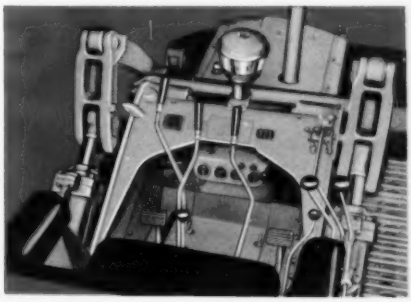
NEW 1⅛ CU. YD. BUCKET

12½% larger bucket than on the Series E. Matching increased capacity are longer bucket reach and greater digging depth.



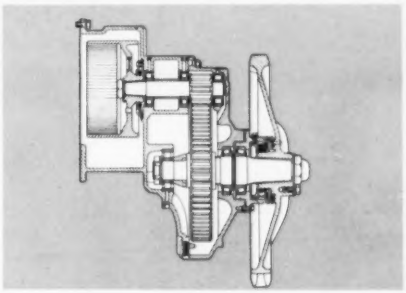
NEW 52 HP ENGINE

New power plant is shorter, more compact. Individual fuel pump barrels and plungers fit directly into single fuel pump housing for simple, unit servicing. New engine balancers give smoother operation.



NEW OPERATOR COMFORT

Convenient grouping of easy operating controls and instruments—ample leg room—new, comfortable seat—all contribute to greater operator comfort.

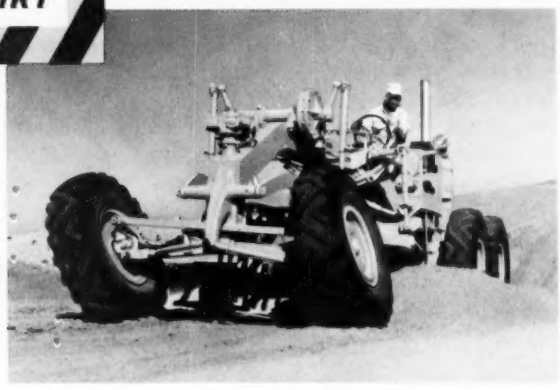


NEW POWER TRAIN

4 forward speeds (1.51 to 5.48 MPH) and new, 3.67 MPH reverse boost production. Improved, stronger, heavier final drive gears assure life to match increased machine capacity. Time-proved, dependable oil clutch is standard.

CATERPILLAR'S
PROJECT PAYDIRT

Let us demonstrate IN ACTION!



Over the past few months, you've seen examples of Project Paydirt in action: the *new* No. 14 Motor Grader—*new*, more powerful D8 Tractor—*new* DW20 and DW21 wheel Tractors, *new* No. 435, No. 456, No. 470, No. 482 Scrapers, *new* lifetime lubricated rollers—*new* dry-type air cleaners.

These—and many more new products to come—are the answer to your demand for more productive equipment that will help keep you ahead of competition, move more dirt at lower cost.

Call us! We're ready to demonstrate how Project Paydirt developments can increase your profits!

CATERPILLAR

Caterpillar, Cat and Traxcavator are Registered Trademarks of Caterpillar Tractor Co.

BECKWITH MACHINERY COMPANY

6550 Hamilton Aveue, Pittsburgh, Pa.
Old Town Road, Clearfield, Pa.
361-369 Congress St., Bradford, Pa.
1356 E. 12th St., Erie, Pa.
Route 219 North, Somerset, Pa.
Buckhannon Pike — Route 20, Clarksburg, W. Va.

OHIO MACHINERY CO.

6606 Schaaf Road, Cleveland, Ohio
930 Kinnear Road, Columbus, Ohio
2807 Reynolds Road, Toledo, Ohio
U.S. Route 250, Cadiz, Ohio
4000 Lake Park Road, Youngstown, Ohio

WALKER MACHINERY CO.

1545 Hansford Street, Charleston, W. Va.
4010 Emerson Ave., Route #2, Parkersburg, W. Va.

CM-8

DT-1305

PRINTED IN U.S.A.

SEND COUPON TODAY!

Send me more information on the equipment I've checked.

- ☐ New D7 Tractor
- ☐ New D8 Tractor
- ☐ New No. 933 Traxcavator
- ☐ New No. 14 Motor Grader
- ☐ _____ (other)

NAME_____

FIRM_____

ADDRESS_____

CITY_____ STATE_____

by wet scrubbers, with dust reclaimed either to dried coal conveyors or the furnace fuel feeder.

Sampling and Car Loading

All coal fractions from the coarse and fine coal systems are collected on four belt conveyors which deliver to five railroad loading tracks. Dried steam coal is normally loaded on track 1 but can also be loaded on track 2. Sized coal is loaded on track 2. Dewatered stoker-size coal is loaded on track 3, and dried metallurgical coal is loaded on tracks 4 and 5.

Separate, fully automatic sampling equipment is provided for both the dried steam coal and dried metallurgical coal ahead of the loading facilities. Each system includes a primary cutter, vibratory feeder, sample crusher and a secondary feeder with cutter.

A common sampling system is provided for the dewatered stoker-size coal and sized coal, consisting of a primary sample cutter for each belt and a common primary sample bucket which transfers the sample to the sampling column.

Refuse Disposal System

Rock, shale and other plant refuse, except for the shale to be used as raw material for the lightweight aggregate plant, is disposed of in a deep valley on the other side of a hill behind the plant. The refuse is collected on a 36-in. wide belt conveyor which carries it 2,400 ft. up a slope. The belt is driven by a 400-h.p. motor through a D-250 parallel shaft speed reducer.

An unusual feature of this belt conveyor is an arrangement by which the belt is turned over after discharging material, so that on the return run the top side of the belt is up. This avoids build-up of material on the return idlers. At the bottom of the run the belt is turned again to its normal position.

The refuse disposal system is designed as a flexible system that can be adjusted as the pile grows. The slope belt discharges to a tower boom stacker which can be rotated in a wide arc and lifted up or down to discharge the refuse in the direction desired. At present this stacker is discharging directly into the valley.

However, a rail-mounted 36-in. trailing belt conveyor designed for sectional extension to a maximum length of 600 ft. will be installed in the near future. This conveyor will discharge to a traveling fixed boom stacker which will have a 70-ft. radius of swing and a traversing speed of 6 f.p.m.

The plant was furnished by the Link-Belt Pershing Road plant in Chicago. The Link-Belt Colmar, Pa., plant furnished the thickeners.

JACK A. HASTEN
Caterpillar Tractor Co.

● Jack A. Hasten, District Representative in the Central Sales Division of Caterpillar Tractor Co. since 1957, has been named supervisor of the Track-Type Tractor Section of Sales Development at Peoria, the company announces.

A graduate of the University of Notre Dame, Hasten has been associated with Caterpillar since 1942. He served for the past two years as district representative in the sales territories of Burford-Toothaker Tractor Co., Montgomery, Ala., and Thompson Tractor Co., Inc., Birmingham, Ala. Prior to that he served for three years as Engine Representative in the Central Sales division.

Ditching work with a motor grader requires power and high production, both of which are features of the new Caterpillar No. 14 Series B Motor Grader. High production is assured through a balanced relationship of size (19' 2" wheelbase), weight (29,050 pounds), and horsepower (150 hp turbocharged engine). Adequate traction is assured by the 22,000 pounds of weight resting on the drive wheels. A large capacity 12-foot moldboard, 27 inches high, is coupled with forward travel speeds ranging from 2.6 to 21.6 mph. Other production boosters standard on the No. 14 include power assisted brakes, power steering and a new positive mechanical lock on the power contro's. The complete range of blade positions, including the 90° maximum bank cutting angle has been retained.

Modern Equipment At Industrial Coal Company

● Like all other progressive coal strippers, the Industrial Coal Company of Lisbon, Ohio, has continuously progressed toward the use of late type stripping machinery. At its operation lying just South of Lisbon, the Industrial Coal Company is stripping with a Model 4500 Manitowoc dragline and 6 yard bucket and a Model H-D 21 A-C tractor. The Ohio number 6 seam of coal running 32 inches thick is being stripped. Overburden consists of sand and lime rock. Up to 35 feet of overburden is being moved.

LONG INTRODUCES UTILITY CAR

● "Inspector's Friend" is the name of a new multi-purpose utility car that is now being manufactured by the Long company, Oak Hill, W. Va.

This new 3-wheeled, rubber-tired vehicle is battery operated and is designed for certain types of personnel transportation and light supply handling. With a capacity of 500 pounds plus operator, it's especially suitable for such applications as: travelling between belt drive unit and the face; transportation for maintenance force, supervisory and engineering personnel; supplying items to the face during the working cycle, and assisting in rock dusting.

Although the "Inspector's Friend" is similar to the small mobile personnel cars used so widely in large industrial plants, it's been specifically designed to include a number of features required for coal mine use. It can be maneuvered readily in tight quarters, will operate two full shifts between battery charges, is available in either open or permissible type electrical construction, and is made in three tramming heights (24", 36", and 60") for operating in both low and high coal. Other specifications are: width-52⅞"; length-103⅛"; speed-4 miles per hour.

For additional information on the LONG "Inspector's Friend," write manufacturer at P. O. Box 331, Oak Hill, West Virginia.

Can You Afford Good Haul Roads In Your Stripping Operations?

● Practically everyone agrees that good haul roads in stripping operations pay substantial dividends in increased production, greater operator safety and comfort and less equipment maintenance.

In the past several years there has been a trend toward use of larger, faster vehicles in an attempt to keep hauling costs down. But heavy loads at high speed tax haul roads, demanding solid footing, shallow grades, gradual curves and good traction.

Contrary to many guesses, such coal mine roads are not an expensive luxury which only a few can-afford. Improved roads can pay for themselves many times over. The big question is: How much can you afford to put into haul road improvements?

To find the answer to that question you must:

1. Determine the increase in production which would result from the contemplated improve-units made possible while retaining present production.

2. Determine the saving which would accrue from the improved production rate.

3. Decide whether the improvement can be made for a cost equal to or lower than the savings which would be generated.

Improving the condition of a mine's haul road — reducing its rolling and grade resistances and eliminating sharp curves—can result in faster travel speeds. Under most conditions, rolling resistance can be reduced by providing good drainage to reduce formation of ruts, by mechanical compaction, by using a rock base where required, or by employing stabilizing additives, such as calcium chloride, cement, oil, etc. Frequently production gains will justify cutting

Equipment already owned can do most of the work of improving haul roads. This tractor-scraper team, for example, can be used in hauling fill for chuck holes and other depressions in the road.

New Cat No. 14 Motor Grader is shown at work on a haul road. Improving rolling resistance of a haul road will pay off in greater operator safety and comfort, faster cycle time and less equipment downtime.

through or building a road around such grades. Hazards and bottlenecks caused by sharp curves may be profitably removed, or at least eased

Probably the most common problem, however, is that of rolling resistance. Ground condition and load primarily effect rolling resistance—the deeper a wheel sinks into the ground, the higher the rolling resistance. Other factors, such as internal friction and tire flexing, also must be accounted for. As a result, experience shows that a minimum rolling resistance of 40 lbs. per ton of weight on the wheels must be overcome just to move the machine. For each one inch of tire penetration, an additional 30 lbs. per ton of weight must be overcome.

Therefore, to estimate rolling resistance requirements, the following formulas may be used:

Total RR—RR factor (lbs. /ton) X Wt. (tons) on Wheels
Where
RR Factor—40 lbs./ton X 30 lbs./tons (for each 1 inch penetration)

With this formula in mind, we may now determine what increase in production would result from a given improvement.

To illustrate, assume that you plan to improve a one-mile section of haul road at a strip mine by decreasing rolling resistance from 100 to 75 pounds per gross ton of weight. Your coal hauler has a gross weight of 72.5 tons, including a 45 ton payload, and its present cycle time is 15 minutes.

Current Haul Road Condition

Rolling resistance factor of 100:
Total RR—100X72.5—7,250 lbs. rimpull required.

(Based on this rimpull, speed of a Cat DW20 Tractor—Athey PH20 Coal Hauler—would be about 10 mph.)

Total Travel Time—
5,280 ft. —6 min.
10 mphX88 ft./min.
Production (tph)—
45 tons/cycle X 45 min.—hr.
15-min./cycle
—135 tph

Improved Haul Road Condition

Rolling resistance factor of 75:
Total RR—75X72.5—5,440 lbs. rimpull required.

(Based on this rimpull, travel speed of a Caterpillar DW20 Tractor — Athey PH20 Coal Hauler—would be 12.9 mph.)

Total Travel Time—
5,280 ft. —4.6 min.
12.9 mph X 88 ft./min.
Time Saved—6 min.—4.6 min.—1.4 min.
New Cycle Time—15 min.—1.4 min.—13.6 min.
Production (tph)—
45 tons/cycle X 45 min.-hr.
13.6 min./cycle
—148 tph.

Thus it can be seen that lessening rolling resistance on one mile of haul road will yield an increase in production of 13 tons per hour —without additional equipment.

To determine the savings which would result from an improved production rate we must compare hourly equipment costs with hourly production.

Assuming hourly owning and operating cost of the coal hauling equipment to be $16.46, at a production of 135 tph, then cost per ton would be:

$16.45—135 or $12.19

Using the same equipment cost but the increased production figure of 148 tph, cost per ton would be:

$16.46—148 or $11.12

This represents a saving of $1.07/ton. On the basis of one million tons hauled annually over the improved road, a 2.9 mph gain on one mile of haul road would justify an expenditure of up to $10,700 on haul road improvements.

In addition, you can use equipment you already own to accomplish most of the road improvement. Scrapers and bulldozers can supply the fill. A motor grader can crown the road and cut highly-necessary drainage ditches. After the road has been put in good shape, only occasional passes of the motor grader will be necessary to remove bumps, fill slight depressions, and clear small bank slides.

Good haul roads will more than return their value to a coal mine operator in increased production. greater safety and lower costs of of operation and maintenance.

A Caterpillar No. 12 Motor Grader equipped with moldboard is maintaining 3½ miles of haul road on coal mining operations, east of Albright, West Virginia. This machine can cover this distance in approximately 4-hours.

Most Stripping Done With Tractor At Phillips Coal & Coke Co.

Over-all view of the operation. The TD-24 in foreground is stripping overburden. The Lorain shovel can be seen directly behind this tractor.

TD-18 pushing overburden spoiled by the shovel.

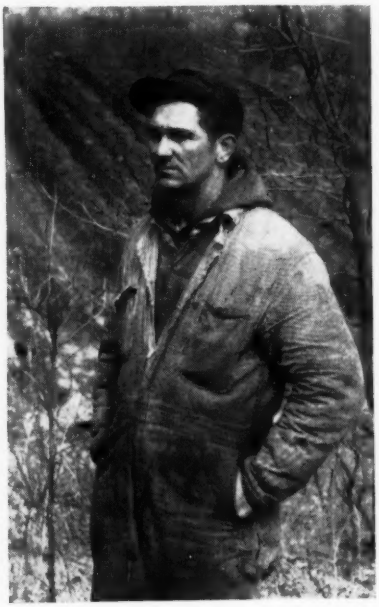
● There is not much Beehive coke made in Fayette County, Penna. any more due principally to exhaustion of the Connellsville Coking Coal Seam. In the Southern end of that County, near McClellandtown, the Redstone coal runs about 32 inches in thickness and is generally high enough in quality to make a suitable coke. The Phillips Coal & Coke Company is stripping the Redstone seam for Coke making purposes, using a International TD-24 tractor to push most of the overburden off the coal. The harder overburden is stripped with a Lorain Model 75 shovel with spoils onto the coal seam. The spoil from the shovel is then pushed to the spoil bank by a International TD-14 tractor.

● The 1959 National First-Aid and Mine Rescue Contest will be held at the Buffalo Memorial Auditorium, Buffalo, N. Y., Oct. 5-7, the General Contest Committee has decided. This contest is under the sponsorship of the Joseph A. Holmes Safety Association in cooperation with the National Coal Association, United Mine Workers of America, State mining departments, local mining institutes, and coal operators' associations. The banquet, at which winners will be announced and prizes awarded, will be held on the last day at the Statler Hilton, the contest headquarters. Harry Gandy, Jr. of NCA's staff is chairman of the Contest Arrangements Committee and also its treasurer.

● The retirement of Charles M. Shoffner as chief executive officer of Pittsburgh and Shawmut Coal Co. and Allegheny River Mining Co., at Kittanning, Pa., was announced. Mr. Shoffner, who had served the companies 23 years, will devote his time to his group of Ringgold companies engaged in coal production and sales in central and western Pennsylvania and northern West Virginia, and to other business properties in Kittanning.

Tractors Strip All Overburden At Collins & Walton Coal Company

● Operated now by two sons of one of the founders of the Collins and Walton Coal Company, Earl and Everet Walton are moving all overburden off coal in the vicinity of Welston, Ohio, with two Allis Chalmers HD-19 and three HD-21 tractors. Up to 20 feet of overburden is moved. Stripped ore is backfilled by the tractors and the reclaimed area is planted in tree and grass.



Everet Walton

TRACTORS STRIP ALL OVERBURDEN AT COLLINS AND WALTON COAL COMPANY

The International Model 495 Paywagon — one of the three new earthmovers just announced by International Harvester Company. The 27-cubic-yard machine has a heaped capacity of 40.5 cubic yards.

● Dowty Mining Equipment Ltd., England, has developed a new hydraulically-powered self-advancing roof support system for safer and more efficient room-and-pillar mining.

The new system, called the Dowty Canopy, provides constant protection for the continuous miner and support teams. The system is released, advanced and reset by simple valve controls. Operation of the Canopy is rapid, promoting maximum productivity.

The Canopy system consists of two twin-section support units interconnected by a framework of longitudinal and transverse roof beams. The rear section of each support incorporates three hydraulic props, and its base houses a double-acting hydraulic jack, the rod of which is attached to the rear end of the front support section. This incorporates two hydraulic props. Valve boxes control setting and release of the props, and extension and closure of the jacks.

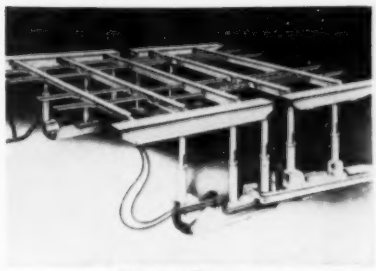
To advance the system, the front section of one support is released from the roof and thrust forward by closure of the hydraulic jacks, section. It is then reset, and the front section of the second support advanced in a similar manner. The rear section of the first support is next released, hauled forward by closure of the hydraulic jack, and reset to the roof, the cycle being completed by similarly advancing the rear section of the second support.

By advancing the support sections alternately, effective roof support is continuously maintained, affording complete protection throughout all stages of advance. Roof bolting can also be carried out from the protected area.

All control points are readily accessible and valve operation is simple. Floor penetration is minimized by the large basal areas of the supports.

A working model of the Dowty Canopy will be exhibited at the Cleveland Coal Show, May 11-14. (Booth No. 2665)

Additional information on the Dowty Canopy may be obtained from Dowty Mining Equipment Ltd., Ajax, Ontario, Canada.



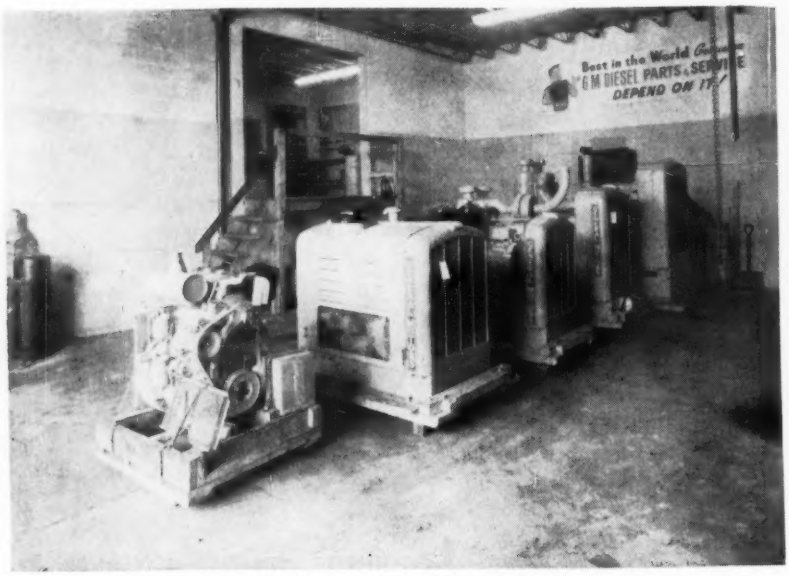
Dowty Canopy

Formal Opening Of Keystone Diesel Engine Co., Inc.

● Formally announcing it opening, the Keystone Diesel Engine Co., Inc. held open house Friday and Saturday, February 27 and 28. Located on Route 19 in Wexford, Pennsylvania, about 14 miles North of Pittsburgh, the Keystone Diesel Engine Co., appointed distributer for General Motors Diesel engines, will sell and service in 31 Counties in Western Pennsylvania. A fleet of trucks is on call at all times to service industrial petroleum, Marine and truck engines and Hydrostarters. A repair and rebuilding shop equipped with latest injector rebuilding and precision overhauling is also available.

This new organization is headed by Art Boseti, former regional manager for Detroit Diesel Engine. Division of General Motors, has had 15 years experience in this region. Frank Chase, Jr. Vice-president and Sales Manager was manager and applications engineer for 15 years with the Highway Equipment Co. Highlighting the occasion was the first showing in this region of the new series 53 engines of the General Motor Diesel line.

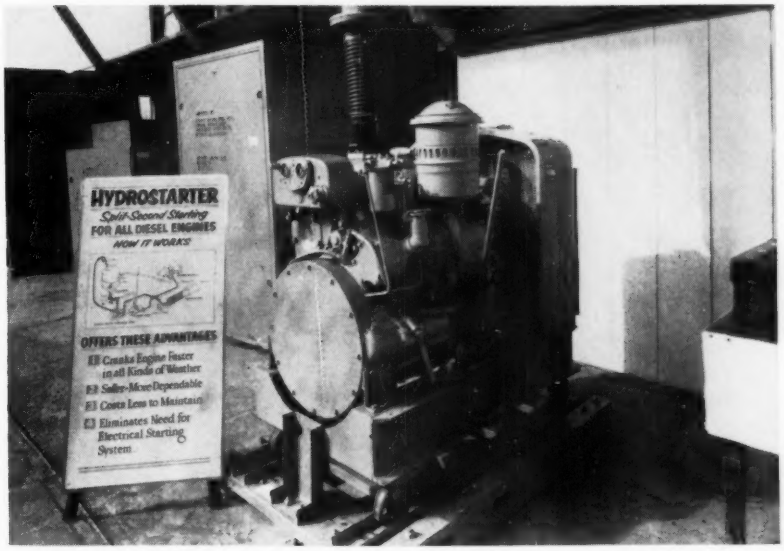
Over-all view of the office and showroom.



Various size engines in stockroom. Over-all view of office and show room.

Owners are: Art Boseti, right, President and Frank Chase, left, Vice-President.

FORMAL OPENING OF KEYSTONE DIESEL ENGINE CO., INC.



Hydrostarter, split-second starter for all Diesel engines, was on display.

● Addition of a new No. 933 Series F Traxcavator to its line has been announced by Caterpillar Tractor Co. Designed as an all-around digging and loading tool, the new machine has several efficiency-increasing improvements over the former model.

Features of the machine are a completely new engine, new, stronger power train, larger-capacity bucket and an operator's compartment built for maximum comfort.

The new four cylinder engine, rated at 52 flywheel HP, differs considerably from the former engine. A compact fuel pump housing contains the barrel and plunger assemblies, a new, round fuel rack and a horizontalacting governor, all in one unit. Permitting easier adjustment and longer wear for all parts, the housing requires less space alongside the engine. Exclusive, capsule-type fuel pumps are retained for easy maintenance. Truly modern in design, the 4 in. bore x 5 in. stroke engine is 350 lbs. lighter and nine inches shorter. In addition, it is equipped with a dynamic balancer to minimize engine vibration, resulting in a smooth-running power plant.

Other noteworthy engine features includethe use of cam-ground pistons, requiring only 3 rings and substantially improving oil control; improved valves and head, incorporating a short valve train which lessens valve weight and increases the life of camshaft lobes; and a new starting engine, having, as standard, a pressure lubrication system common with the diesel engine.

Service life of the power train for the No. 933 Series F has been lengthened by several important modifications. The bottom of the bevel gear and transmission compartments has been increased in thickness to boost rigidity and strength. An improved brake offers full-contact braking with 30% less operator effort; new access doors are provided for easier, faster servicing of the brake parts. Final drives have been strengthened through use of wider, heavier teeth on pinion and gears.

Outboard pinion bearings are of a high capacity type. Easier service is provided by pressing on gears and locking them in place with a retainer nut. Unfastening the nut provides immediate removal of the entire assembly.

Use of a new cluster gear in the transmission provides a new, high-speed reverse for faster backing. With a reverse speed of 3.67 mph (up from 3.04 mph on the previous model), the No. 933 Series F offers faster cycle times and more economical production.

The most significant change in the shovel portion of the No. 933 Series F is the increased bucket capacity. A new, 1⅛-yard heavy-duty bucket is standard, replacing the former 1-yard bucket. With the increase in bucket capacity, combined with higher reverse speed, the new No. 933 has been able to gain an overall production increase of up to 20% in jobs ranging from basement digging to loading loose stockpile material. Operating studies have shown that the larger bucket can be fully loaded in the same time as the 1-yard unit—a finding which tends to prove its easier loadability.

To facilitate easier operation in demanding terrain, ground clearance has been increased 2 inches, to 12.5 inches.

Operator comfort has been increased on the new No. 933 with the addition of a seat comparable to those used on the Company's larger Traxcavators. Use of an easy-to-read instrument panel and relocation of the air clearer on the rear of the engine play a part in increasing comfort. Coupling these changes with the new, smooth-acting brakes means less operator fatigue and more working time each day.

The new Caterpillar No. 933 Series F Traxcavator incorporates a lighter-weight engine rated at 52 flywheel horsepower, an improved power train, and a bucket with 12½% larger capacity than that on the previous model.

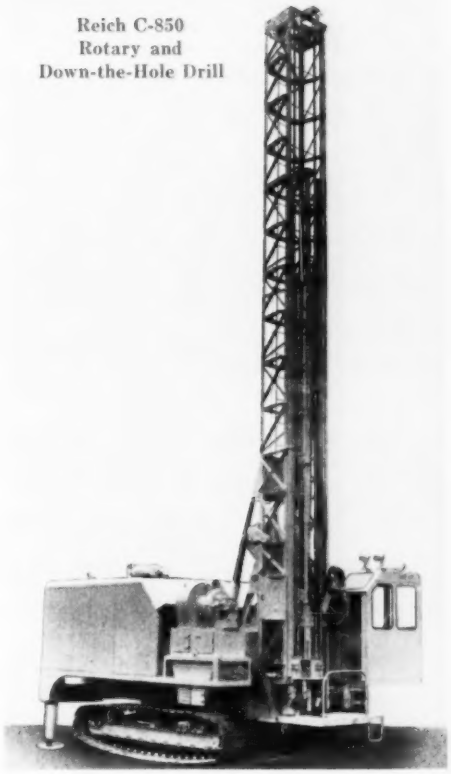
Parts

Prove it ON YOUR OWN WORK . . . side-by-side with your present equipment

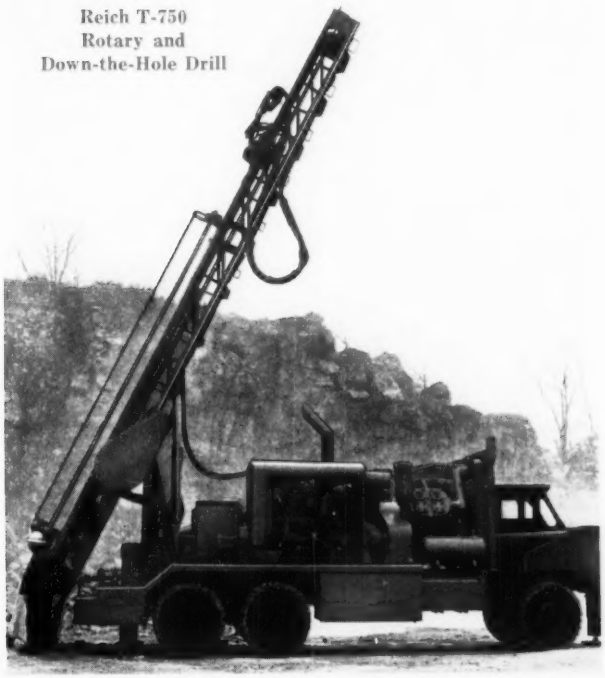
We're GLAD to demonstrate! If the Reich doesn't ***out-drill any other rig you may have*** — pound for pound of weight, and dollar for dollar of investment — we won't expect you to be interested.

Drilling blast hole in hard sandstone and shale, owners report up to 80% more hole with the Reich, than with other rigs of same rating. That's why you see so many of the largest and most successful coal companies using the Reich.

Reich C-850
Rotary and
Down-the-Hole Drill



Reich T-750
Rotary and
Down-the-Hole Drill



FOR BIGGEST PRODUCTION,
you need the Reich's —

Exactly Right Drilling Speed in every stratum (it is the only hydraulic rotary giving ANY speed of rotation); **Fastest Stem Loading,** just a few seconds; **Easiest Operation,** with minimum levers, hydraulically actuated. A real one-man rig.

For Demonstration write, wire or phone —

FRANK SWABB EQUIPMENT CO.
Hazleton National Bank Bldg.
Hazleton, Pa. Phone Gladstone 5-3658

Your SAFEST way of buying a REICH is our SUREST way of selling it

Highway service crew, Pittsburgh. Ernie Sarver, shop superintendent, is in center front.

Pittsburgh parts department staff. Al Bischoff, parts manager, is in center front.

Parts and Service

Parts and Service **are of first importance on every job.**

And—one of the big reasons why more and more leading contractors and mine operators depend on Highway for *all their equipment needs,* is Highway's superior parts and service.

AA-9008

Part of Pittsburgh service truck fleet. A similar fleet is maintained at Du Bois.

Highway's parts departments meet every need of every customer.

Highway

HIGHWAY EQUIPMENT COMPANY

6465 Hamilton Ave. • Pittsburgh 6, Pa.
40 Hoover Ave. • Du Bois, Pa.

Allis-Chalmers • Lima Shovels, Cranes, Draglines • Master Thor • Gar Wood • Lima Roadpackers
Jaeger • Rogers Trailers • Heltzel
Buffalo-Springfield • Tractomotive

● A new steel-like material may offer engineers a replacement for plain steel forgings and permit design flexibility of castings.

It was developed by General Motors Central Foundry Division and GM Research Laboratories, and described to the American Foundrymen's Society.

Known as Centra-Steel, the material consists of iron plus the following elements: 1.70% carbon, 2.25% silicon, 0.40% manganese, 0.10% sulfur, 0.05% phosphorus, 0.01% boron and some tellurium.

The metal has a high elastic modulus of 28,000,000 pounds per square inch — very nearly equal to that of steel. This means it will not deform until this pressure is exceeded. The material has the equivalent strength of steel and better castability and machinability. It does not require extensive heat treatment, costly addition agents, injection apparatus or low maximum sulfur content.

The material's high silicon, low carbon content is the reverse of normal iron founding experience, but this proportion accounts for the material's high modulus and great versatility. This high elastic modulus suggests applications to parts for which many presently available cast materials would be unacceptable.

The metal is still in an experimental stage. Work is underway on foundry problems that will have to be solved before high-volume production is begun.

WE'RE PROUD TO ANNOUNCE WE NOW SELL AND SERVICE THE BUCYRUS-ERIE 54-B and 71-B ELECTRICS!

These two electric shovels and draglines have established outstanding reputations all over the world. Now we are pleased to add them to the complete line of Bucyrus-Erie excavators we have offered you in the past.

WHAT ARE ELECTRIC MACHINES?

Basically, these machines perform the same tasks as other excavators, except they are powered by *electricity* which is more economical on big production jobs in fairly stationary operations. Large mine and quarry owners have established the real value of this type excavator. The machines are referred to as 3-motor electrics because they have 3 reversible DC motors — one for swing, one for crowd (shovel) and one for hoist. Each motor is directly connected to its function, eliminating operating clutches and brakes. In this manner, independent control is obtained for each motion. Both direction and speed of functions are controlled finely because the motors are reversible.

HOW CAN THEY BE EQUIPPED?

Electric excavators can be equipped with nearly all front-ends used on other Bucyrus-Erie excavators, including crane, shovel, dragline, clamshell.

WHAT KIND OF CONTROL?

Bucyrus-Erie Ward Leonard variable voltage control was proved the most efficient in the field, with a tremendous record of trouble-free service! Under this system, each motor has its own generator . . . power is developed when and as it is needed.

We'll be happy to give you more information about the big 54-B and 71-B electrics . . . show you just how the power functions, the pro's and con's of electric machines versus diesel or gasoline power for your specific operations. There's no obligation, of course, so call us today!

BECKWITH MACHINERY CO.

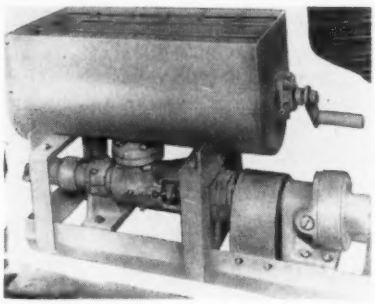
PITTSBURGH	6550 Hamilton Ave.	MOntrose 1-6900
BRADFORD	361 Congress St.	3166
CLEARFIELD	Old Town Rd.	5-9635
ERIE	1356 E. 12th St.	4-2494
SOMERSET	Route 219 N.	SOmerset 6533

CLEVELAND BROTHERS EQUIPMENT COMPANY

HARRISBURG	Route 322	JOrdan 4-2121
WILKES-BARRE	Route 309	VAlley 2-8141
FRACKVILLE	Route 122	701
PHILIPSBURG	307 Alder St.	DIckens 2-4210

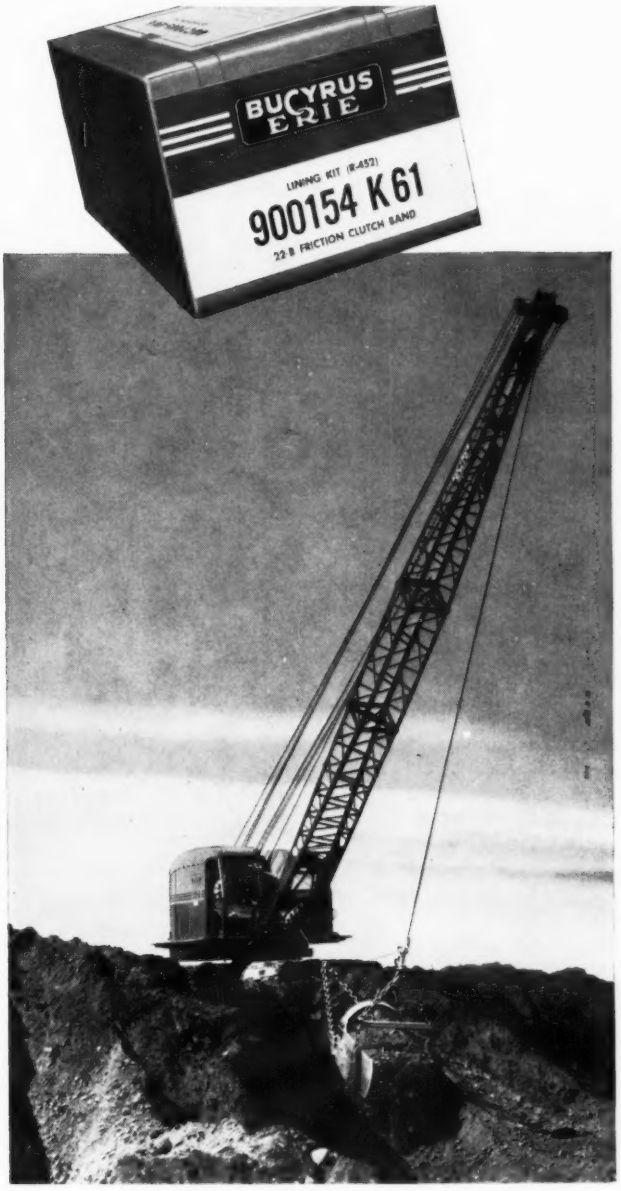
ADVERTISER'S INDEX

APRIL, 1959



New M-S-A Model 80 Slurry Rock Dust Distributor is designed for permanent mounting on any mining machine. Powered either mechanically or hydraulically, the Model 80 is suggested for use in satisfying immediate rock dusting requirements in limited work areas of coal mines.

A Familiar Sign . . . BUCYRUS ERIE *. . . at Scenes of Progress*



GENUINE Bucyrus-Erie Parts, Factory-Trained Men

CAN ADD INSURANCE TO YOUR PROFITS

Get the best performance out of your Bucyrus-Erie crane or excavator by keeping it in top operating condition. Our service men are fully trained and qualified to give you the kind of service that results in extra speed and output —in our shop or in the field.

When you need parts for your Bucyrus-Erie, you'll get genuine Bucyrus-Erie parts built to original equipment specifications—no "will fit" parts that could rob you of time and money on *any* contract.

Our modern parts and service department has the tools and equipment to do the job. Both are designed to give you *fast* service when the chips are down.

Beckwith maintains large stocks of parts ranging from the 10-B to the 88-B. Call us at any of our convenient locations for immediate assistance in determining your parts or repair requirements.

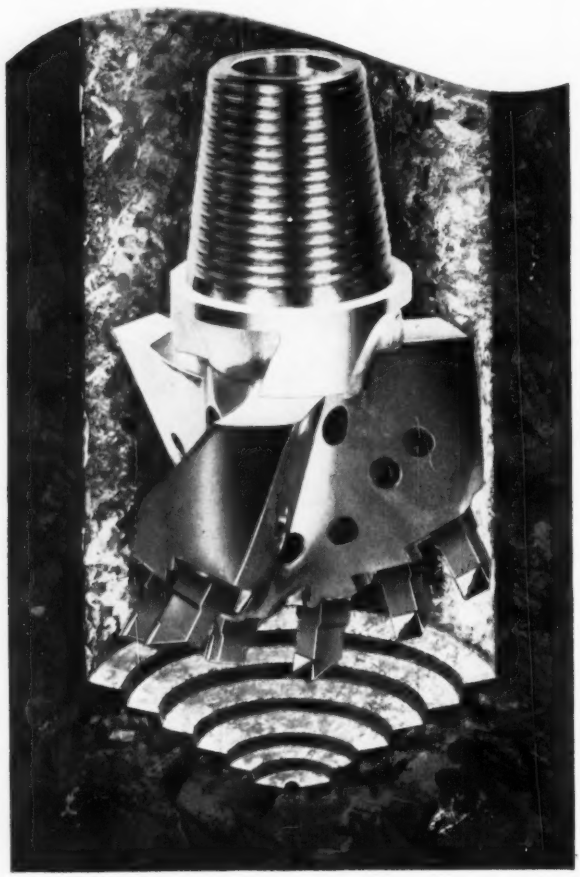
BECKWITH
MACHINERY CO.

BRADFORD, PA. ERIE, PA.
CLEARFIELD, PA.
SOMERSET, PA.

6550 Hamilton Avenue • PITTSBURGH • Phone: MOntrose 1-6900

SEE US FOR COMPLETE INFORMATION

AUSTIN APA DRILL HEAD

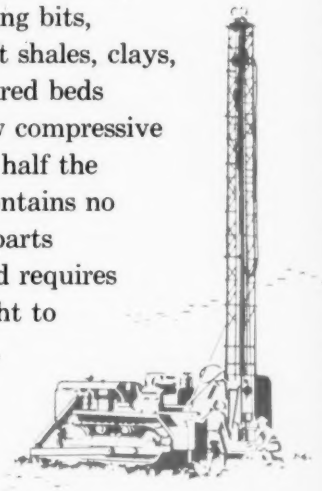


speeds air drilling

cuts costs in soft rock

The 3-wing prop-type Austin APA drill head is specially designed to increase penetration rates and reduce the cost of air drilling in soft rock formations.

When compared with ordinary drill heads with rotating bits, APA cuts through soft shales, clays, shells, soft limestone, red beds and other rocks of low compressive strengths in less than half the usual time. Also, it contains no independent moving parts to become clogged and requires only a moderate weight to gain full effectiveness.



durable bits are easily replaced

APA drill head is furnished with special patented carbide-tipped bits. The latter have tapered shanks that drive-fit firmly into the drill head so that wedges and set screws are not needed. Unlike blade-type drill heads, bits are easily replaced . . . with hammer and punch.

Rapid-cutting carbide-tipped bits drive-fit in drill head. Replaceable in seconds with hammer and punch.

5 SIZES adaptable to any rig

In addition to the Model APA, Austin produces a complete line of drag-bit drill heads with either square or hexagonal shanks that can be adapted to any type of drill rig. All are offered in 5 sizes for cutting holes of from 4⅜" to 8⅝" in diameter.

Austin drill head with hexagonal shank

USED IN 1833 AUSTIN & EVER SINCE

AUSTIN POWDER COMPANY

Cleveland 13, Ohio

explosives • permissible dynamites • mine tools
detonating fuse and clips • AP drill heads • Akremite • primers